

CLAIMS:

1. A method for manufacturing a thin film, comprising the step of applying a force, with a part having a sharp tip, onto an entire area or arbitrary region of a film during or after formation of the film, so as to control a structure of the film.

2. A method for manufacturing a thin film, comprising the step of applying a force, with a part having a sharp tip, onto an entire area or arbitrary region of a film during or after formation of the film, with a temperature of the film maintained at or above a glass transition temperature of a amorphous region, so as to control a structure of the film.

3. A method as set forth in claim 1 or 2, wherein the force applied on the film derives from only the part having a sharp tip.

4. A method as set forth in claim 1 or 2, wherein the force applied on the film derives from the part having a sharp tip, and at least one of an electric force generated by application of an electric field and a magnetic force generated by application of a magnetic field.

5. A method as set forth in any one of claims 1 through 4, wherein the thin film is formed on a substrate.

6. A method as set forth in any one of claims 1 through 5, wherein the part having a sharp tip is an atomic force microscope.

7. A method as set forth in any one of claims 1 through 6, wherein plural areas of the film are simultaneously processed with plural parts having sharp tips.

8. A method for manufacturing a multi-layered film, in which a method of any one of claims 1 through 7 is carried out on all of or some of the layers of the multi-layered film.

9. A thin film having a structure controlled by a force applied on an entire area or arbitrary region of the film by a part having a sharp tip during or after formation of the film.

10. A thin film as set forth in claim 9, wherein a crystalline structure of crystals constituting the film is controlled.

11. A thin film as set forth in claim 9, wherein an orientation direction of crystals constituting the film is controlled.

12. A thin film as set forth in claim 9, wherein an orientation direction of molecules in crystals is controlled.

13. A thin film as set forth in claim 9, wherein the film includes crystals according to any two of or three of claims 10, 11, and 12.

14. A thin film as set forth in claim 9, wherein at least two regions of crystals constituting the film are controlled according to at least one of claims 10 through 12.

15. A thin film as set forth in any one of claims 9 through 14, wherein the film is formed on a substrate.

16. A multi-layered film having a structure according to any one of claims 9 through 15 controlled by carrying out the method of any one of claims 1 through 8 on all of or some of the layers of the multi-layered film.